

## ABSTRACT OF THE DISCLOSURE

An object of the present invention is to realize an economical optical transmitter-receiver having a simple structure, which is suitable for a high-speed optical communication system. In addition, another object of the present invention is to achieve improvement in operation speed of a traveling-wave element, which uses a compound semiconductor in particular, using an easy technique. In the present invention, a high-frequency electric line on a mounting substrate becomes a traveling-wave electrode of a semiconductor optical element equivalently by the following steps: separately manufacturing the mounting substrate having the high-frequency electric line, and the semiconductor optical element for which high-frequency design has been applied beforehand; and then bonding and mounting (that is to say, junction down mounting) of drive electrodes of the mounting substrate and the semiconductor optical element through a soldering material. In addition, it is also possible to have a configuration in which not only junction down mounting of high-frequency semiconductor optical elements, but also that of an electronic element for electrically driving and controlling a light source such as a semiconductor laser and for electrically driving and controlling a high-frequency semiconductor optical element, is performed on the mounting substrate described above.